REMARKS

On page 2, paragraph 1 of the Final Rejection, the Examiner stated that claims 22-33, which are drawn to the non-elected invention with traverse, must be canceled. In accordance with the Examiner's direction, these claims have been canceled.

On page 2 of the Office Action, the Examiner has rejected claims 11-16 and 18-21 under 35 U.S.C. 102 or 103 over Varma. Independent claim 11 discloses two molecular formulas, one of which is S-(I/B)-S and the other is [S-(I/B)]nX (a radial polymer). Varma does not teach a formula having 65 wt% styrenic block copolymer. Varma teaches an SBS or an SIS, and according to the Examiner, an S-I/B-S. The Examiner refers to paragraph 0071 of Varma for support of S-I/B-S. However, Varma does not teach that the midblock can be a mixture of isoprene and butadiene. In fact, the only place describing "a mixture" is in the abstract. Since none of the examples call for a mixture of isoprene and butadiene in the midblock and no other portion of the Varma specification mentions this, there could be a different interpretation as to what is meant by "or mixtures thereof." In the abstract, the sentence starts by saying that the TPE may be a conventional thermoplastic vulcanizate or a block copolymer. The words "or mixtures thereof" could refer to a mixture of vulcanizate and a block copolymer, rather than isoprene and butadiene as the conjugated diene. Claim 11 of Varma discloses a thermoplastic product consisting of a block copolymer and a vulcanizate. Varma appears to teach only SBS or SIS per paragraph 0009 and 0049. It does not appear to teach a blend of dienes I/B. There does not seem to be any disclosure in Varma for the formulas set forth in claim 11 of the present invention. Additionally, there seems to be no support for this formula having at least 65 wt% of the styrenic block copolymer. Paragraph 0071 of Varma, however, does mention that the styrene block can be between 60% and 80%, but this is only when referring to a tri block (either SBS or SIS) wherein the tri block is hydrogenated – SEBS or SEPS. This particular ratio does not apply to a molecular structure set forth in claim 11.

Claim 11 continues stating that the isoprene/butadiene midblock would be in a weight ratio range of 30/70 to 70/30. This is not disclosed in Varma.

Claim 11 continues stating that the midblock has a glass transition temperature of, at most, -60°C. This is not disclosed in Varma. Claim 11 continues by stating that the styrenic block copolymer has a polystyrene content in the range of 28 to 31 % by weight. As set forth at the bottom of paragraph 0071, the minimum weight of styrene is 60% and it could be a maximum of 80%. This is the opposite end of the scale of the present invention. The present invention requires a small amount of styrene whereas Varma requires a large amount of styrene in the block copolymer.

Likewise, the true molecular weight of the styrene in the block copolymer is from 10,000 to 15,000. As set forth in paragraph 0071, the styrene molecular weight will have a range of 50,000 to 150,000. Again, this is completely at the opposite end of the scale of the present invention.

Claim 11 continues stating that a second thermoplastic resin is present in the composition in an amount of 5 to 25 wt% and the resin is selected from polystyrene, ethylene, propylene, or copolymers of ethylene/propylene. The second components of Varma are the TPV blends which are ethylene/propylene rubber. The rubber is not a thermoplastic resin. Also, Varma teaches the blending of a polybutene.

Styrenic block copolymers (SBC) differ in length, weight (molecular), polarity, ratio of isoprene to butadiene, reactivity, and importantly, glass transition temperature or Tg. Further, the midblocks of an S-I/B-S polymer can be different and lead to different properties and characteristics of the SBC. Indeed, often times it is the structure of the midblock, including ratio of components, identity of components, whether they are hydrogenated or not, molecular weights, etc., that determine the characteristics of the resultant SBC. In the art it is well known that controlling the makeup of the midblock can determine the physical and chemical characteristics and reactivity of the whole SBC. Thus, each of these characteristics is important in distinguishing a SBC and defining

what type and kind of polymer it is. The structure, while important, is only one aspect of the whole SBC. Indeed, a polymer is identified by not only its structure, but by its physical, chemical, and potentially properties when blended with other components, many of which can be and are determined by the makeup of the midblock. As such, the similarity in basic structure of two SBCs does not mean that the properties of the SBCs are similar. Varma does not disclose or teach Applicant's invented compound. Varma does not teach the ratio of components in the midblock nor does it speak to the required purity of the butadiene and isoprene. Most importantly, however, Varma does not even mention the Tg requirement. Thus, Varma does not render Applicant's invention anticipated under 35 U.S.C. 102 nor obvious under 35 U.S.C. 103.

Thus it is clear that Varma does not disclose the limitations of claim 11 under 35 U.S.C. 102. With respect to 35 U.S.C. 103, the Examiner must make a supposition that all of the missing components set forth in claim 11 are obvious in view of Varma. Since Varma fails to disclose many of the limitations in claim 11, it is difficult to see how the Examiner can assert that such limitations are obvious.

On page 2 of the Office Action, the Examiner rejected claims 11-16 and 18-21 under 35 U.S.C. 102 or any alternative under 35 U.S.C. 103 as being unpatentable over Maekawa et al.

Maekawa et al. only teach the S-I/B-S copolymer. They do not teach any glass transition temperature as called for in claim 11. They do not teach a conjugated diene of isoprene and butadiene in the range from 30/70 to 70/30, and all the examples of this reference teach hydrogenated compounds. Thus, this is S-EB-EP-S (sometimes written as SEEPS), not S-I/B-S nor (S-I/B)nX.

The second component of the composition of Maekawa et al. is a (meth)acrylic acid, (meth)acrylate, or (meth)acrylonitrile. It is not a polystyrene, polyethylene, or polypropylene as claimed in claim 11. Since the midblock of Maekawa's block copolymer is hydrogenated, it is clear to those skilled in the art that the Tg is not "at most

-60°C" as claimed in claim 11. Thus it is clear that Maekawa et al. neither anticipate nor makes obvious claim 11 and its independent claims.

Styrenic block copolymers (SBC) differ in length, weight (molecular), polarity, ratio of isoprene to butadiene, reactivity, and importantly, glass transition temperature or Tg. Further, the midblocks of an S-I/B-S polymer can be different and lead to different properties and characteristics of the SBC. Indeed, often times it is the structure of the midblock, including ratio of components, identity of components, whether they are hydrogenated or not, molecular weights, etc., that determine the characteristics of the resultant SBC. In the art it is well known that controlling the makeup of the midblock can determine the physical and chemical characteristics and reactivity of the whole SBC. Thus, each of these characteristics is important in distinguishing a SBC and defining what type and kind of polymer it is. The structure, while important, is only one aspect of the whole SBC. Indeed, a polymer is identified by not only its structure, but by its physical, chemical, and potentially properties when blended with other components, many of which can be and are determined by the makeup of the midblock. As such, the similarity in basic structure of two SBCs does not mean that the properties of the SBCs are similar. Maekawa et al. do not disclose or teach Applicant's invented compound. Maekawa et al. do not teach the ratio of components in the midblock nor do they speak to the required purity of the butadiene and isoprene. Most importantly, however, Maekawa et al. do not even mention the Tg requirement. Thus, Maekawa et al. do not render Applicant's invention anticipated under 35 U.S.C. 102 nor obvious under 35 U.S.C. 103.

On page 3 of the Office Action, the Examiner rejected claims 11-16, 18-21 and 34 under 35 U.S.C. 102 as being anticipated by, or any alternative under 35 U.S.C. 103 as being obvious over Zhang et al. With respect to new claim 34, it is limited to the multiple arm formula of S-I/B which is coupled to a coupling agent "x" such that arms of S-I/B are present.

Zhang et al. do not teach the glass transition temperature of the conjugated diene I/B. There is no Tg of at most -60°C. Thus, Zhang et al. do not reach limitations in claim 11 nor meet the limitations in claim 34. Moreover, both claim 11 and claim 34 call for the styrenic block copolymer to comprise at least 65 wt% of the composition. Atop page 14 of Zhang et al., they teach that the maximum composition of the styrenic block copolymer is 55 wt%. Therefore, Zhang et al. do not meet the limitations in claims 11 and 34 calling for a minimum amount of the styrenic block copolymer. Zhang et al. do not disclose the 30/70 to 70/30 weight ratio of the conjugated diene I/B, and do not disclose that the di-block S-I/B optionally occurs in the content of at most 20 mol%. While these arguments certainly eliminate Zhang et al. as a 102 reference, it is clear Zhang et al. are not a proper reference under 35 U.S.C. 103 because they do not even disclose any range of these portions of the composition claimed. Thus, the Examiner cannot make an argument that these things are taught by Zhang et al. when the reference is totally silent.

REPLY IN RESPONSE TO THE EXAMINER REMARKS

The Examiner states that paragraph 0071 of Varma teaches the combination of the conjugated diene being isoprene and butadiene. Paragraph 0071 makes no such teaching.

The Examiner states that paragraph 0071 of Varma teaches the ratio of styrene to diene and it anticipates Applicants' 30/70 to 70/30 ratio. Again, the Examiner is confused. The 30/70 to 70/30 ratio is only with respect to the ratio of isoprene to butadiene in a conjugated midblock. It is not a statement about the polystyrene content of the block copolymer being in a range of 28 to 31 % by weight as claimed.

On page 4 of the Office Action, the Examiner states that the glass transition temperature of the diene block must be sufficiently low as set forth on page 14, lines 31-34 of Zhang et al. While the Examiner is correct with what Zhang et al teach, they do not teach is a glass transition temperature of, at most, -60°C. The Examiner assumes that low glass transition temperatures are in that range, but these are mere relative words, and no one skilled in the art knows what low glass transition temperature really means.

In paragraph 13 of the Office Action, the Examiner is again confused and compares the styrene to diene block ratio with Applicant's limitations in both claims 11 and 34, with the diene block ratio of isoprene to butadiene of 30/70 to 70/30. These are not the same.

The Examiner recites in paragraph 14 bridging pages 4 and 5 of the Office Action that the isoprene/butadiene block copolymer is essentially the same as that of the prior art. And the Examiner, therefore, relies on *In re Fitzgerald et al.*, a case the undersigned has heard many times. The Examiner has misunderstood what *In re Fitgerald et al.* stand for. Styrenic block copolymers differ in length, molecular weight, polarity, ratio of isoprene to butadiene, reactivity, and glass transition temperature, to name just a few of the variables that are possible. Furthermore, even the midblock of isoprene/butadiene

can be different, such as random copolymer, or sequential polymerization. Those skilled in the art would take a completely opposite view of the Examiner's statement and would say that merely calling for a midblock would not disclose enough details to those skilled in the art to be able to reproduce Applicant's invention. This is why it is necessary in the claims that Applicant mentions sufficient limitations to allow those skilled in the art to reproduce Applicant's invention as it is disclosed. Without knowledge set forth in Zhang et al. to allow one to repeat Applicant's invention, it is clear that the requirements of 35 U.S.C. 102 and 35 U.S.C. 103 are not met. Certainly, the Examiner has not disclosed that Zhang et al. teach the general conditions. Since the general conditions are not taught by Zhang et al., certainly no one skilled in the art has sufficient information to optimize by routine experimentation in any of the compositions claimed in the present invention.

It is noted that these claims in their present form have been allowed by the European Patent Office and these claims have been allowed in view of Zhang et al.

CONCLUSION

It is believed that this Application is now in condition for Examination and such is solicited.

Respectfully submitted,

Date: August 10, 2010

/Gregory N. Clements/
Gregory N. Clements
Registration No.: 30,713
Attorney for Applicant

CLEMENTS | BERNARD
1901 Roxborough Road, Suite 250
Charlotte, North Carolina 28211 USA
Telephone: 704.790.3600
Facsimile: 704.366.9744
gclements@worldpatents.com